

HITACHI

SERVICE MANUAL

TY

No.452 E

TRK-W22

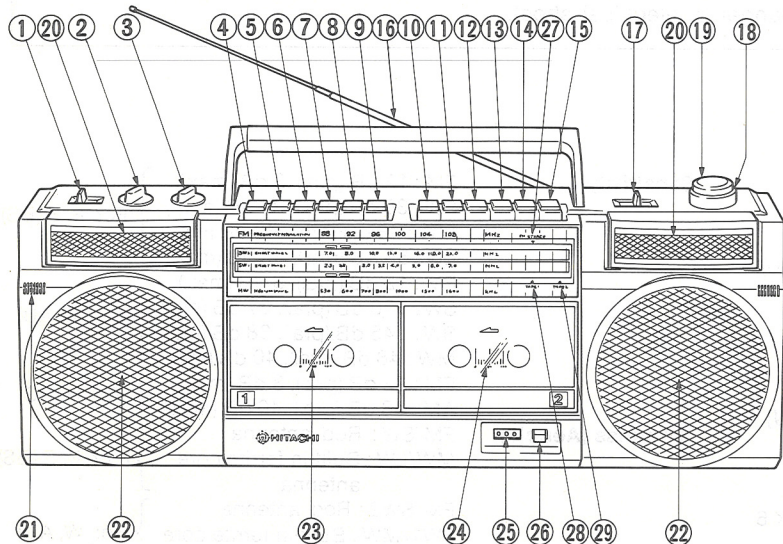
H, HC, E, E(BS), W, AU

TN-33ZVC-681 Chassis

TN-33ZVC-682 Chassis

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KEY TO ILLUSTRATIONS

- | | | |
|---------------------|--------------------------|------------------------------------|
| ① FUNCTION SELECTOR | ⑩ PAUSE BUTTON | ⑩ ROD ANTENNA |
| ② TONE CONTROL | ⑪ STOP/EJECT BUTTON | ⑪ BAND SELECTOR |
| ③ VOLUME CONTROL | ⑫ FAST FORWARD BUTTON | ⑫ TUNING CONTROL |
| | ⑬ REWIND BUTTON | ⑬ FINE TUNING CONTROL (W, AU only) |
| | ⑭ PLAYBACK BUTTON | ⑭ 2 cm TWEETER |
| | ⑮ CONTINUOUS PLAY BUTTON | ⑮ INNER MICROPHONE (MONAURAL) |
| | | ⑯ 10 cm SPEAKER |
| | | ⑰ TAPE 1 CASSETTE HOLDER |
| | | ⑱ TAPE 2 CASSETTE HOLDER |
| | | ⑲ TAPE COUNTER |
| | | ⑳ COUNTER RESET BUTTON |
| | | ㉑ FM STEREO INDICATOR |
| | | ㉒ TAPE 1 INDICATOR |
| | | ㉓ TAPE 2 INDICATOR |

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT.

RADIO/DOUBLE CASSETTE TAPE RECORDER

May 1985

TOYOKAWA WORKS

SAFETY PRECAUTION

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine Hitachi's replacement parts. Especially critical parts in the power circuit block should not be replaced with other makes. Critical parts are marked with Δ in the circuit diagram and printed wiring board.
2. Before returning a repaired unit to the customer, the service technician must thoroughly test the unit to ascertain that it is completely safe to operate without danger of electrical shock.

SPECIFICATIONS

General Section

Semiconductors

ICs : 4
Transistors : 10 [For E]
9 [For E (BS), W, (AU)]
8 [For H, HC]

Diodes : 16 [For W]
15 [Except W]

LEDs : 3

Power supply

AC : 220 V, 50 Hz [For E]
AC : 240 V, 50 Hz [For E (BS), AU]
AC : 110 - 127 V/200 - 220 V
230 - 250 V, 50/60 Hz [For W]
AC : 120 V 60 Hz [For H, HC]
DC : 9 V ("D" CELL or IEC R20 \times 6
or equivalent)

Power Consumption

16 W

Power Output

9 W P.M.P. (AC operation)
6 W M.P.O. (AC operation)
2 W/CH (T.H.D. 10 % DC)
Woofer : 10 cm, 4 ohms \times 2
Tweeter : 2 cm, 300 ohms \times 2
570(W) \times 208(H) \times 132(D) mm
4.3 kg (with batteries)

Speakers

Dimensions

Weight

Radio Section

Circuit System

FM/SW/MW/LW 4-band
[For E, E (BS)]
FM/SW2/SW1/MW 4-band
[For W, AU]
FM/AM 2-band [For H, HC]
Superheterodyne

Tuning Range

FM : 87.5 to 108 MHz
SW : 6 to 18 MHz
MW : 530 to 1,605 kHz
LW : 150 to 285 kHz
FM : 88 to 108 MHz
SW2 : 7 to 22 MHz
SW1 : 2.3 to 7 MHz
MW : 530 to 1,605 kHz
FM : 88 to 108 MHz
AM : 530 to 1,605 kHz

Intermediate Frequency

FM : 10.7 MHz
AM : 465 kHz [For E, E (BS)]
AM : 455 kHz [For W, AU, H, HC]

Sensitivity

FM : 12 dB (pra.), 3 dB (max.)
SW : 30 dB (pra.), 20 dB (max.)
MW : 48 dB (pra.), 40 dB (max.)
LW : 55 dB (pra.), 48 dB (max.)

FM : 12 dB (pra.), 3 dB (max.)
SW2 : 30 dB (pra.), 27 dB (max.)
SW1 : 45 dB (pra.), 38 dB (max.)
MW : 48 dB (pra.), 40 dB (max.)

FM : 12 dB (pra.), 3 dB (max.)
AM : 48 dB (pra.), 40 dB (max.)

Antennas (Aerials)

FM/SW : Rod antenna
MW/LW : Built-in ferrite core
antenna

FM/SW2 : Rod antenna
SW1/MW : Built-in ferrite core
antenna

FM : Rod antenna
AM : Built-in ferrite core
antenna

Tape Recorder Section

Tape

Cassette tape (C-30, 60, 90)

Track System

4 track 2 channel stereo

Recording System

AC bias, 55 kHz

Erasing System

DC erase

Frequency Response

Normal : 60 to 10,000 Hz

Signal to Noise Ratio

40 dB

Wow and Flutter

0.25 % (WRMS)

Cross Talk

Between tracks : 65 dB
Between channels : 40 dB

Input Sensitivity and Impedance

Mic : 0.6 mV, 1.2 kohms
Line-in : 500 mV, 330 kohms

Output Load Impedance

Headphone : 8 ohms-100 ohms

Distortion

3 %

Erasing Ratio

60 dB

Fast Forwarding or Rewinding time

110 sec (using C-60)

Motor

DC motor

Heads

Permalloy

DISASSEMBLY

1. Cassette lid Removal (Fig. 1)

Insert a screw driver (→) in the direction of arrow to remove the claw.

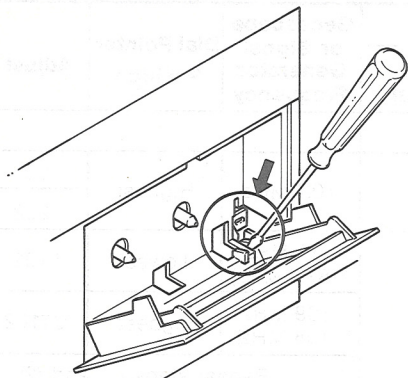


Fig. 1

2. Rear Case Removal (Fig. 2, 3)

- (1) Remove the battery lid.
- (2) The rear case can be removed by removing 8 screws (A). Remove pin connectors P101 of the Tuner P.W.B. and PL601 of the Power P.W.B. at that time.

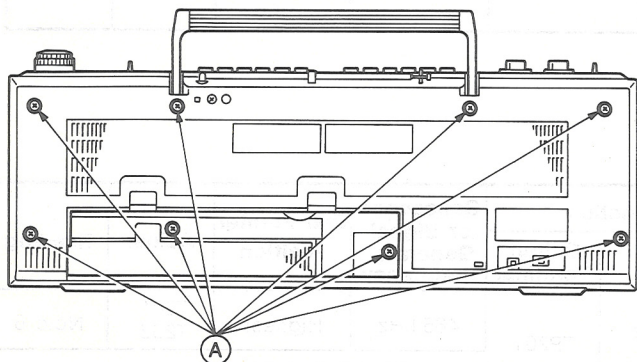


Fig. 2

3. Tuner P.W.B. Removal (Fig. 3)

Remove the fixing screw (B) and pull the Tuner P.W.B. toward you out of 2 guide pins.

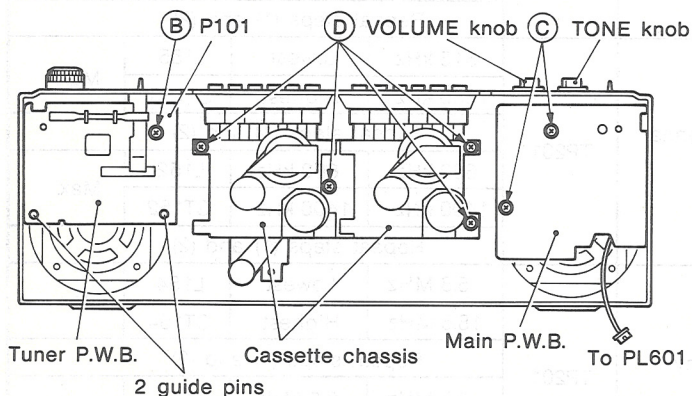


Fig. 3

4. Main P.W.B. Removal (Fig. 3)

- (1) Pull out the TONE, VOLUME knobs.
- (2) Remove 2 fixing screws (C) and the Main P.W.B. is removed when the terminals (LINE IN, EXT MIC, PHONES) and switches (INN MIC, SP, FM MODE, RIF) are pulled out of the front case.

5. Cassette chassis (TAPE 1 and TAPE 2) Removal (Fig. 3)

The cassette chassis (TAPE 1 and TAPE 2) are removed while they are assembled together by removing 4 screws (D).

6. Speaker Removal (Fig. 4)

Remove 4 fixing screws (E) after the Tuner P.W.B. and Main P.W.B. are removed.

7. Power P.W.B. Removal (Fig. 5)

Remove 2 screws (F) and pull out the Power P.W.B. toward the front.

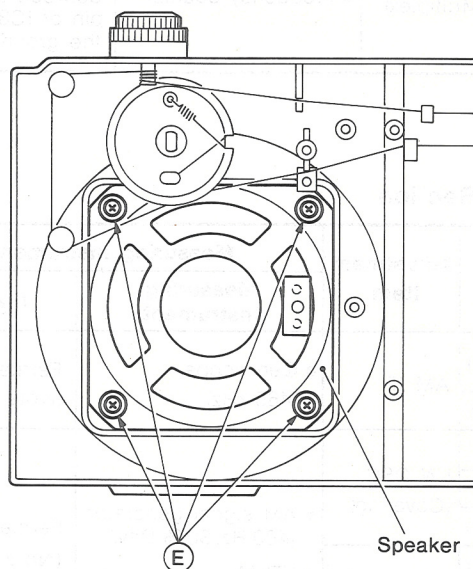


Fig. 4

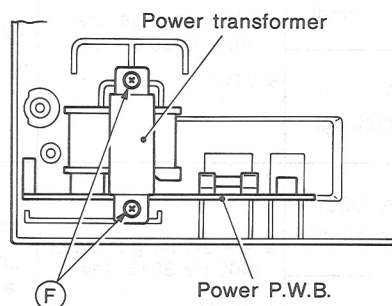


Fig. 5

ADJUSTMENT

1. Radio Section

FM Section

* () For W. Germany

Step	Adjustment Item	Measuring Instrument and Connection			Genescope or Signal Generator Frequency	Dial Pointer Position	Adjust	Reading
		Measuring Instrument	Input Terminal	Output Terminal				
1	(1) FM IF	Turn T202 fully counterclockwise.						
	(2) S-Curve	● Genescope (10.7 MHz)	TP102	TP201	10.7 MHz	Highest	T101 T202	Note 1 Note 2
2	(1) FM OSC (Covering)	● FM signal generator (400 Hz, 30 % Dev.) ● Oscilloscope ● VTVM	TP101 (thru FM dummy antenna) (Note 3)	TP201	87 MHz * (87.5 MHz)	Lowest	L102	Max.
	(2)				109 MHz * (108 MHz)	Highest	CT102	
	(3)				Repeat steps (1) and (2)			
3	(1) FM ANT. (Tracking)	● VTVM			90 MHz	90 MHz	L101	Max.
	(2)				106 MHz	106 MHz	CT101	
	(3)				Repeat steps (1) and (2)			
4	(1) FM MPX. (Multiplex)	● Frequency counter	Connect a 10 μ F 25 V electrolytic capacitor between the No.12 pin of IC301 and the ground	TP301	—	—	RT301	19 kHz \pm 20 Hz (Note 4)

AM Section

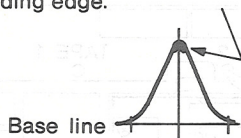
Step	Adjustment Item	Measuring Instrument and Connection			Genescope or Signal Generator Frequency	Dial Pointer Position	Adjust	Reading
		Measuring Instrument	Input Terminal	Output Terminal				
1	(1) AM IF	● Genescope (465 kHz)	Ferrite-core antenna (Note 5)	TP201	465 kHz	Highest	T201 T203	Note 6
	(2)				Repeat step (1)			
2	(1) LW OSC. (Covering)	● AM signal generator (400 Hz, 30 % Dev.) ● VTVM	Ferrite-core antenna (Note 5)	TP201	145 kHz	Lowest	L156	Max.
	(2)				290 kHz	Highest	CT156	
	(3)				Repeat steps (1) and (2)			
3	(1) LW ANT. (Tracking)	● VTVM			160 kHz	160 kHz	L153	Max.
	(2)				270 kHz	270 kHz	CT153	
	(3)				Repeat steps (1) and (2)			
4	(1) MW OSC. (Covering)	● AM signal generator (400 Hz, 30 % Dev.) ● VTVM	Ferrite-core antenna (Note 5)	TP201	515 kHz	Lowest	L155	Max.
	(2)				1650 kHz	Highest	CT155	
	(3)				Repeat steps (1) and (2)			
5	(1) MW ANT. (Tracking)	● VTVM			600 kHz	600 kHz	L152	Max.
	(2)				1400 kHz	1400 kHz	CT152	
	(3)				Repeat steps (1) and (2)			
6	(1) SW OSC. (Covering)	● AM signal generator (400 Hz, 30 % Dev.) ● VTVM	TP101 (thru SW. dummy antenna) (Note 7)	TP201	5.8 MHz	Lowest	L154	Max.
	(2)				18.5 MHz	Highest	CT154	
	(3)				Repeat steps (1) and (2)			
7	(1) SW ANT. (Tracking)	● VTVM			6.5 MHz	6.5 MHz	L151	Max.
	(2)				16 MHz	16 MHz	CT151	
	(3)				Repeat steps (1) and (2)			

Step			Adjustment Item	Measuring Instrument and Connection			Genescope or Signal Generator Frequency	Dial Pointer Position	Adjust	Reading
				Measuring Instrument	Input Terminal	Output Terminal				
For W/AU	8	(1)	AM IF	● Genescope (455 kHz)	Ferrite-core antenna (Note 5)	TP201	455 kHz	Highest	T201 T203	Note 6
		(2)					Repeat step (1)			
	9	(1)	MW OSC. (Covering)	● AM signal generator (400 Hz, 30 % Dev.) ● VTVM	Ferrite-core antenna (Note 5)	TP201	515 kHz	Lowest	L156	Max.
		(2)					1650 kHz	Highest	CT156	
		(3)					Repeat steps (1) and (2)			
	10	(1)	MW ANT. (Tracking)				600 kHz	600 kHz	L153	Max.
		(2)					1400 kHz	1400 kHz	CT153	
		(3)					Repeat steps (1) and (2)			
	11	(1)	SW 1 OSC. (Covering)	● AM signal generator (400 Hz, 30 % Dev.) ● VTVM	TP101 (thru SW. dummy antenna) (Note 7)	TP201	2.2 MHz	Lowest	L155	Max.
		(2)					7.3 MHz	Highest	CT155	
		(3)					Repeat steps (1) and (2)			
	12	(1)	SW 1 ANT. (Tracking)				2.7 MHz	2.7 MHz	L152	Max.
		(2)					6.3 MHz	6.3 MHz	CT152	
		(3)					Repeat steps (1) and (2)			
	13	(1)	SW 2 OSC. (Covering)	● AM signal generator (400 Hz, 30 % Dev.) ● VTVM	TP101 (thru SW. dummy antenna) (Note 7)	TP201	6.7 MHz	Lowest	L154	Max.
		(2)					23 MHz	Highest	CT154	
		(3)					Repeat steps (1) and (2)			
	14	(1)	SW 2 ANT. (Tracking)				8 MHz	8 MHz	L151	Max.
		(2)					20 MHz	20 MHz	CT151	
		(3)					Repeat steps (1) and (2)			
For H/HC	15	(1)	AM IF	● Genescope (455 kHz)	Ferrite-core antenna (Note 5)	TP201	455 kHz	Highest	T201 T203	Note 6
		(2)					Repeat step (1)			
	16	(1)	MW OSC. (Covering)	● AM signal generator (400 Hz, 30 % Dev.) ● VTVM	Ferrite-core antenna (Note 5)	TP201	515 kHz	Lowest	L155	Max.
		(2)					1650 kHz	Highest	CT152	
		(3)					Repeat steps (1) and (2)			
	17	(1)	MW ANT. (Tracking)				600 kHz	600 kHz	L152	Max.
		(2)					1400 kHz	1400 kHz	CT151	
		(3)					Repeat steps (1) and (2)			

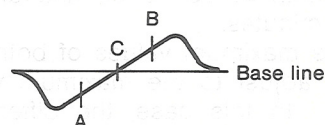
Note :

1. Feed in a weak signal to TP102 from the genescope. Adjust T101 for maximum gain and the waveform indicated in Fig. 6. If the center of the waveform cannot be lined up on the marker, adjust the right/left balance.

Adjust the genescope output so that there is a little noise riding on the leading edge.

**Fig. 6**

2. Use the T202 core to form the S-curve shown in Fig. 7. Adjust the symmetry of A and B about point C for linearity.

**Fig. 7**

3. FM dummy antenna is shown in Fig. 8.

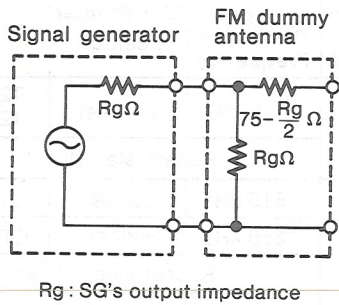


Fig. 8

6. Feed in a weak signal from the genescope. Adjust T201, T203 for maximum gain and the waveform of Fig. 9.

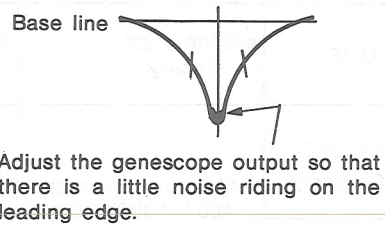


Fig. 9

4. Connect the frequency counter to TP301 and connect a 100 kΩ resistor series with the frequency counter.

5. Connect the output of AM signal generator to the loop antenna, and put it near to the ferrite antenna.

7. SW. dummy antenna is shown in Fig. 10

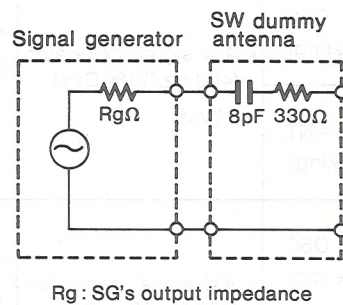


Fig. 10

2. Tape Recorder Section

Perform the following adjustments in the sequence stated after cleaning the head, pressure roller, and capstan with a head cleaning stick moistened in alcohol.

Step	Adjustment Item	Measuring Instrument and Connection			Check Tape	Mode	Adjusted Position	Adjusted Value	Remarks
		Measuring Instrument	Input Terminal	Output Terminal					
1	Tape speed	● Frequency counter	—	Speaker terminal	Tape speed adjustment tape (3 kHz)	Playback	Semivariable resistor in the motor P.W.B. (Fig. 11)	3 kHz ± 20 Hz	Note 1
2	Head azimuth	● VTVM	—	Speaker terminal	Head azimuth adjustment tape (10 kHz)	Playback	Azimuth adjusting screw	Output max.	Note 2

Note :

1. Adjust within 30 sec. after heat-running for more than 20 minutes.
2. When the maximum values of both channels are different, adjust to the maximum value of the L channel. In this case, the difference between the maximum values of both channels should be within 2 dB.

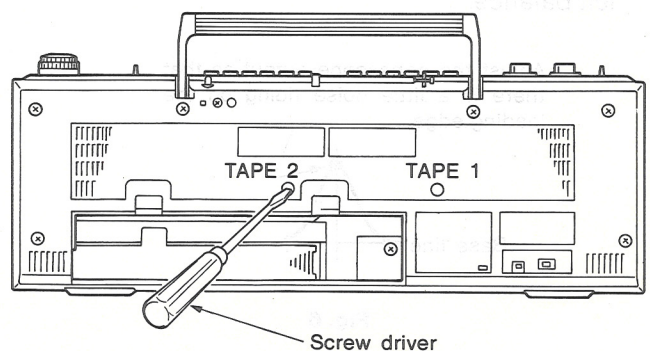
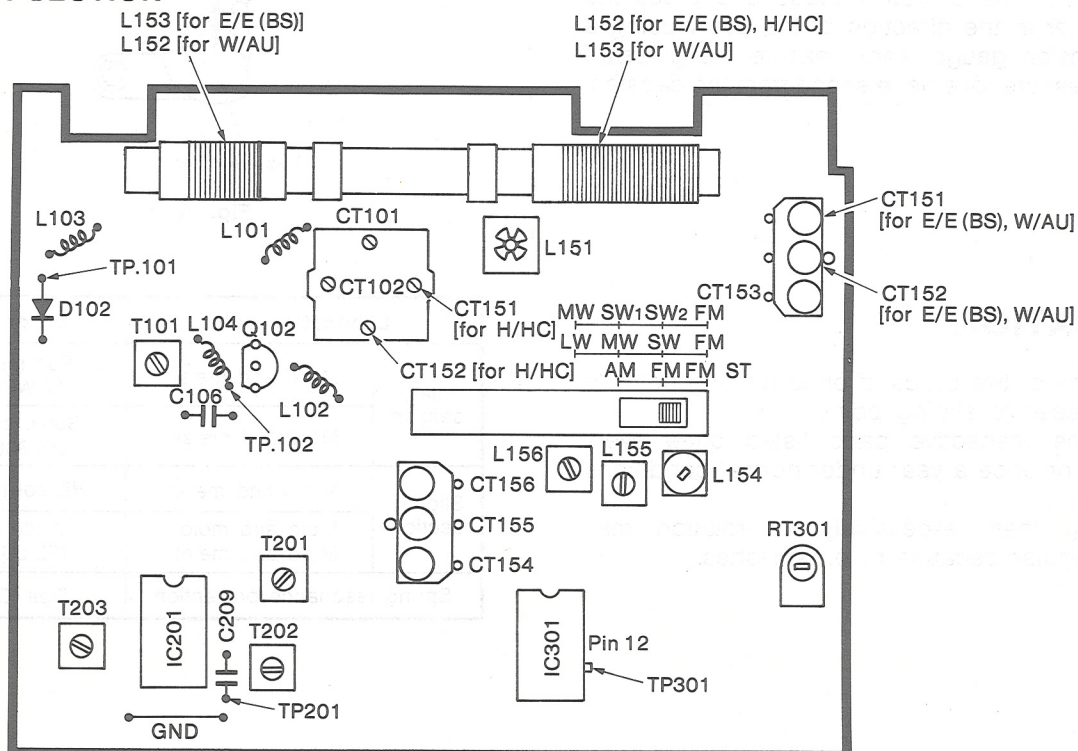


Fig. 11

ADJUSTMENT PARTS LOCATION

•TUNER SECTION



INSPECTION OF MECHANISM

Item	Checking item		Reference value	Remarks
1	Pressure of pressure roller		300 – 500 g	Note
2	Take-up torque		35 – 65 g.cm	
3	Fast forward/Rewind torque		60 – 140 g.cm	TAPE 2
			60 – 140 g.cm	TAPE 1
4	Auto-Stop sensor operation force		40 – 75 g	
5	Brake torque		15 g.cm or more	Measured in stop mode
6	Back tension torque	Take-up	2 – 6.5 g.cm	TAPE 2
			1 – 6 g.cm	TAPE 1
		Supply	2 – 6 g.cm	
7	Flywheel thrust gap		0.05 – 0.5 mm	
8	Button operation force	Play button	1.7 kg or less	
		FF button	1.0 kg or less	
		Rewind button	1.0 kg or less	
		Eject button	1.0 kg or less	
		Record button	1.0 kg or less	
		Pause button	1.5 kg or less	

Note :

Set this unit in the playback mode and press the pressure roller in the direction of the arrow using a fan type tension gauge, and measure the pressure when the pressure roller is released from the capstan.

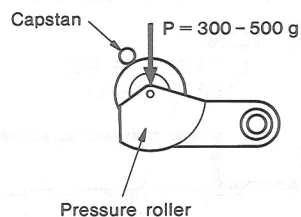


Fig. 12

LUBRICATION

Lubricate one or two drops of oil to rotating point or lubricate grease to sliding point.

Lubricate the respective parts listed once every 1000 hours or once a year under normal conditions of use.

Avoid oiling them excessively, or rotation may become irregular because of oil splashes.

Lubrication point		Oil or Grase
Rotary section	Metal and metal	Pan motor oil (10 W-40)
	Mold and metal	Sonic slider oil (# 1600)
Sliding section	Metal and metal	Hitasol (MO-138)
	Mold and mold Mold and metal	White grease (FL-LUBE-A)
Spring resonance prevention		Floil (GB-TS-1)

DIAL CORD STRINGING

Stringing method

- String the dial cord to each rollers according to the order from ① to ⑧ after turned the pulley to the end of clockwise direction.

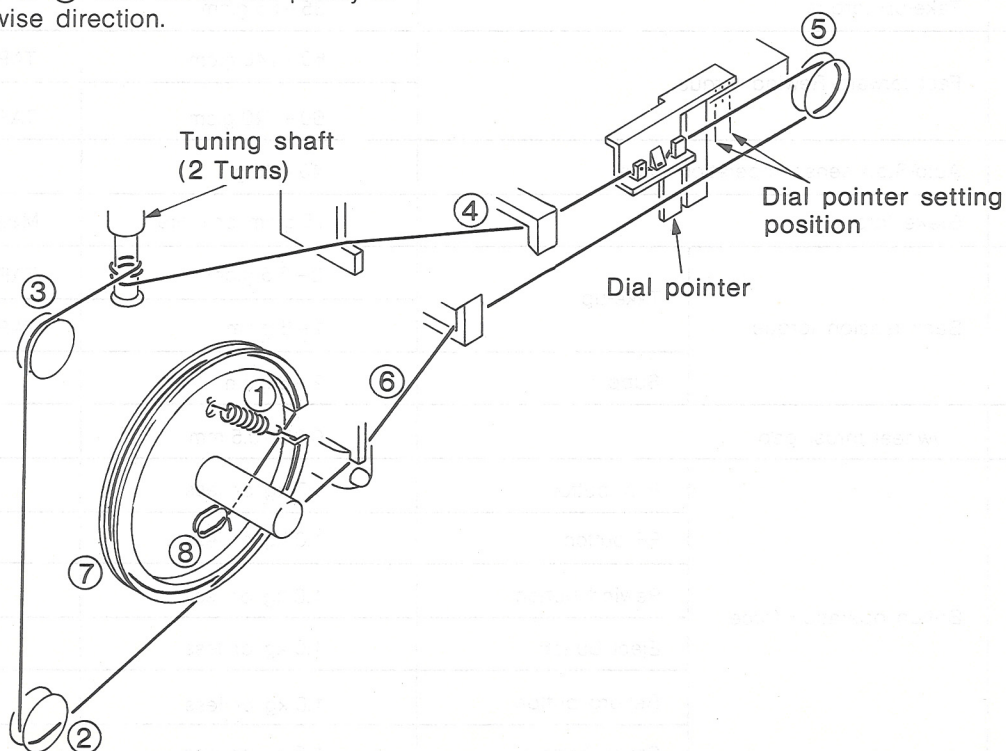


Fig. 13

CIRCUIT DIAGRAM

CAUTION

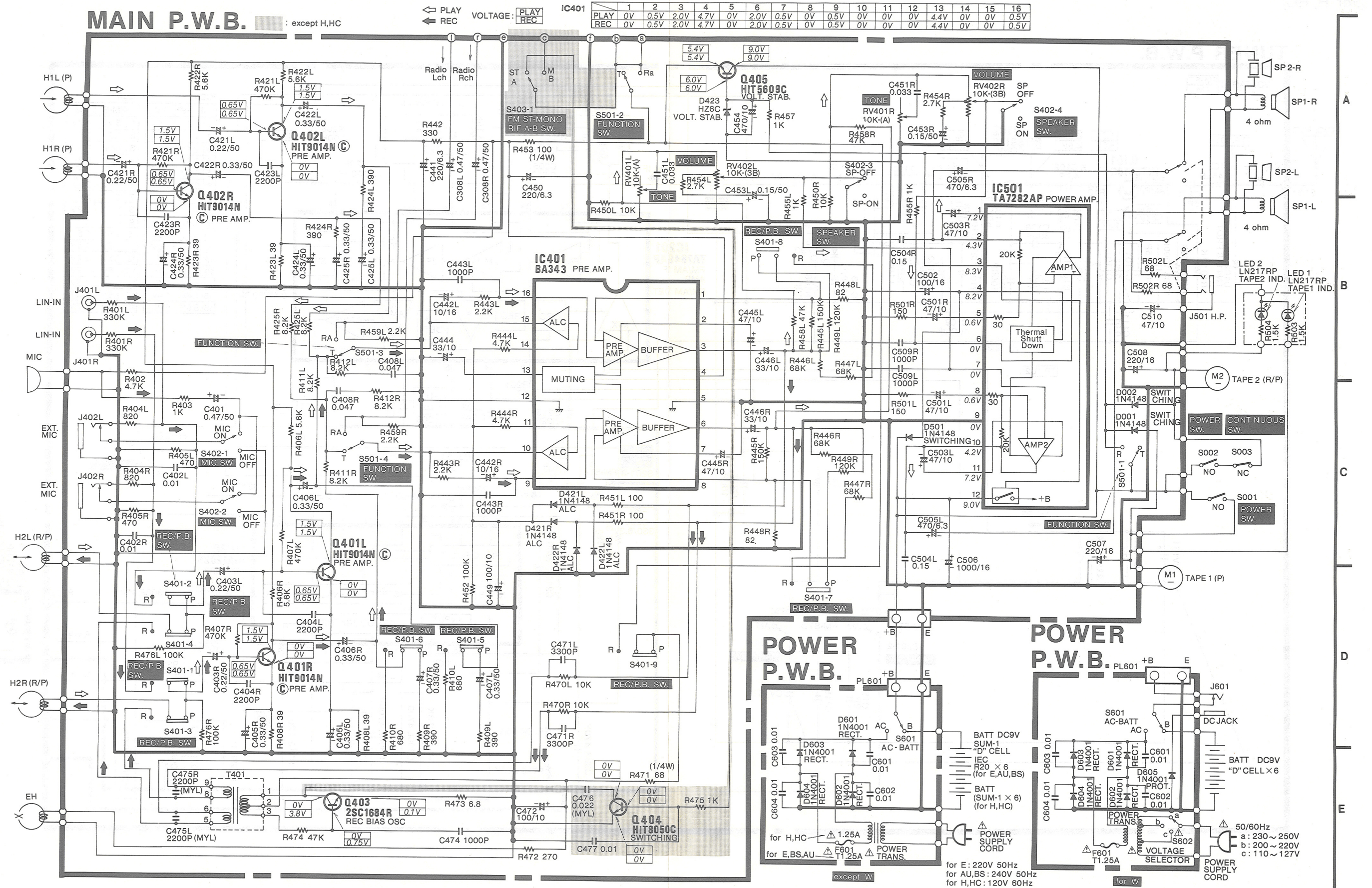
Use the electrolytic capacitors with explosion-proof valve when the diameter of them is more than 10mmφ.

* : Axial lead cylindrical ceramic capacitor

MAIN P.W.B. : except H,HC

PLAY REC VOLTAGE: IC401

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	0V	0.5V	2.0V	4.7V	0V	2.0V	0.5V	0V	0.5V	0V	0V	0V	0V	0V	0V	0.5V
REC	0V	0.5V	2.0V	4.7V	0V	2.0V	0.5V	0V	0.5V	0V	0V	0V	4.4V	0V	0V	0.5V

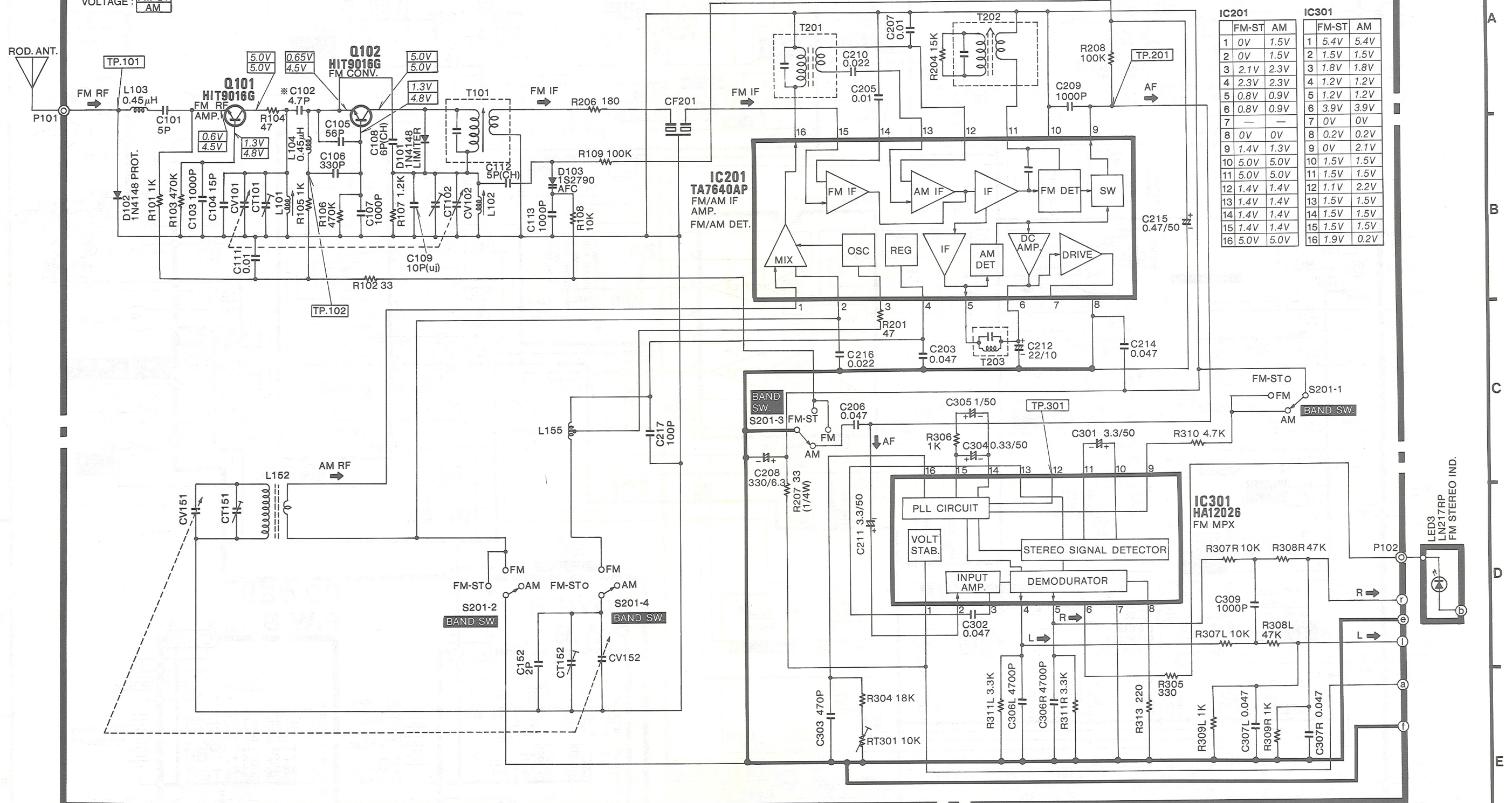


VOLTAGE :

FM-ST
AM

Use the electrolytic capacitors with explosion-proof valve when the diameter of them is more than 10mm ϕ .

IC201			IC301		
	FM-ST	AM		FM-ST	AM
1	0V	1.5V	1	5.4V	5.4V
2	0V	1.5V	2	1.5V	1.5V
3	2.1V	2.3V	3	1.8V	1.8V
4	2.3V	2.3V	4	1.2V	1.2V
5	0.8V	0.9V	5	1.2V	1.2V
6	0.8V	0.9V	6	3.9V	3.9V
7	—	—	7	0V	0V
8	0V	0V	8	0.2V	0.2V
9	1.4V	1.3V	9	0V	2.1V
10	5.0V	5.0V	10	1.5V	1.5V
11	5.0V	5.0V	11	1.5V	1.5V
12	1.4V	1.4V	12	1.1V	2.2V
13	1.4V	1.4V	13	1.5V	1.5V
14	1.4V	1.4V	14	1.5V	1.5V
15	1.4V	1.4V	15	1.5V	1.5V
16	5.0V	5.0V	16	1.9V	0.2V



CIRCUIT DIAGRAM

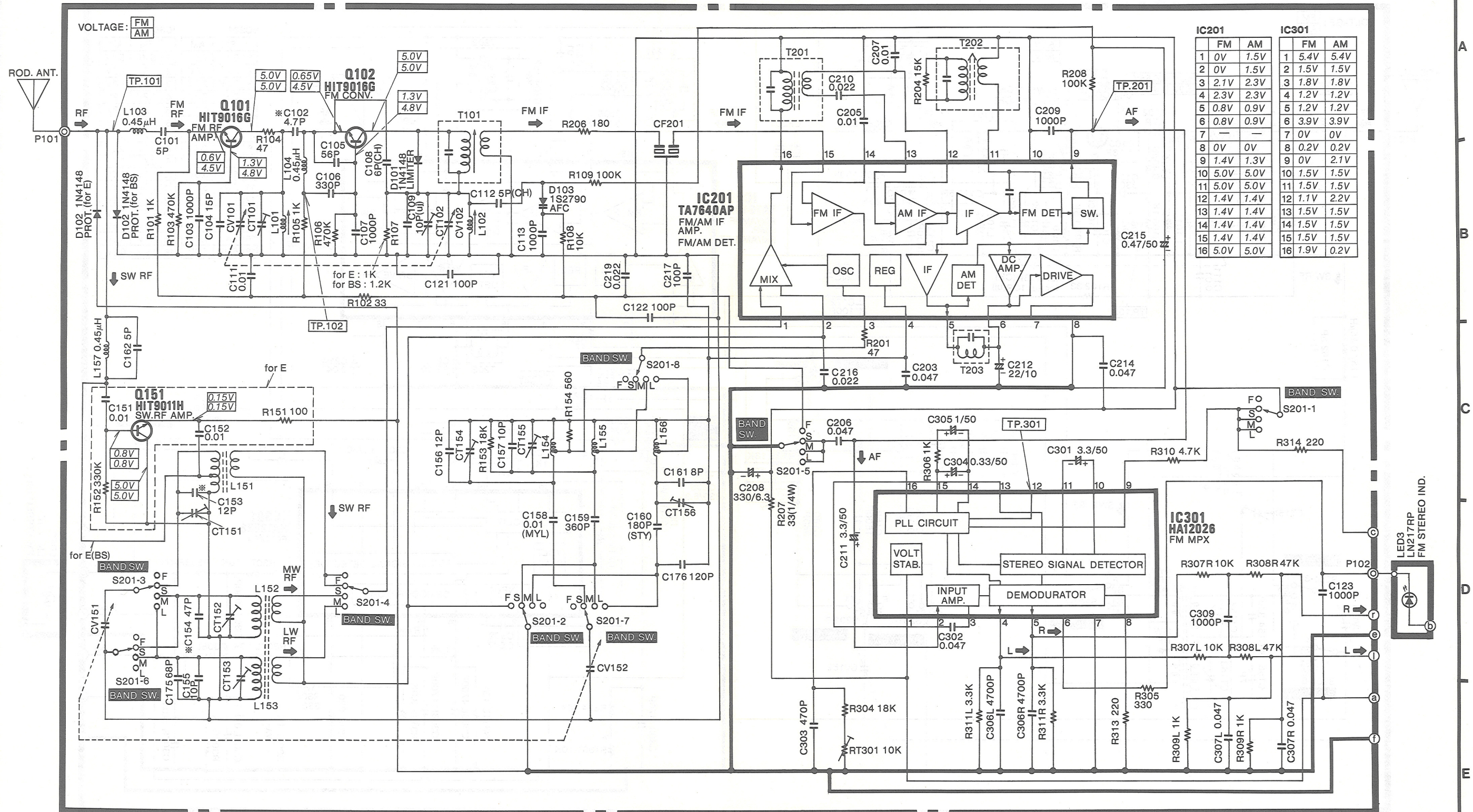
[For E, E (BS)]

CAUTION

Use the electrolytic capacitors with explosion-proof valve when the diameter of them is more than 10mm \varnothing .

※ : Axial lead cylindrical ceramic capacitor

TUNER P.W.B.

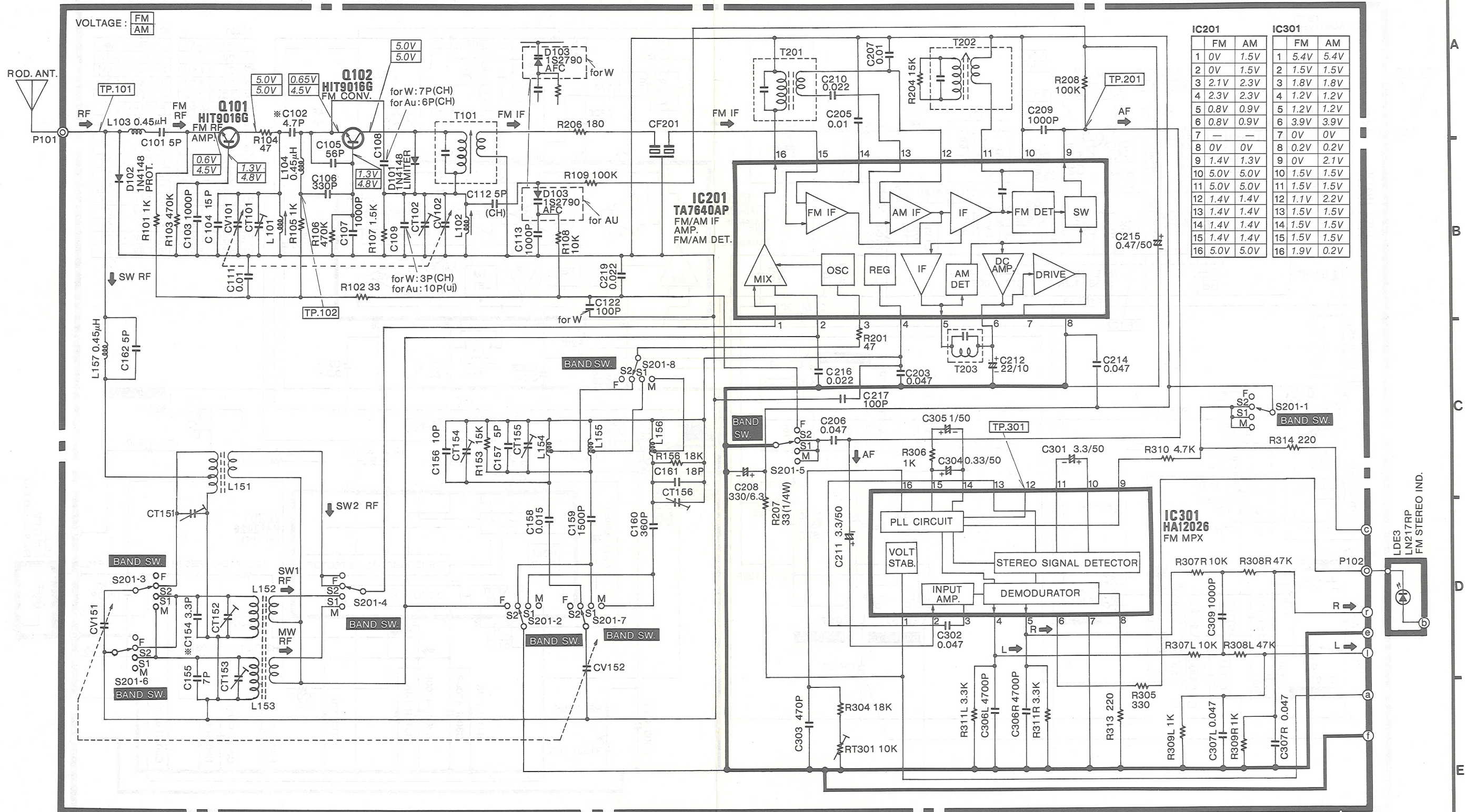


CIRCUIT DIAGRAM
[For W, AU]

CAUTION
Use the electrolytic capacitors with explosion-proof valve
when the diameter of them is more than 10mmφ.

※ : Axial lead cylindrical ceramic capacitor

TUNER P.W.B.

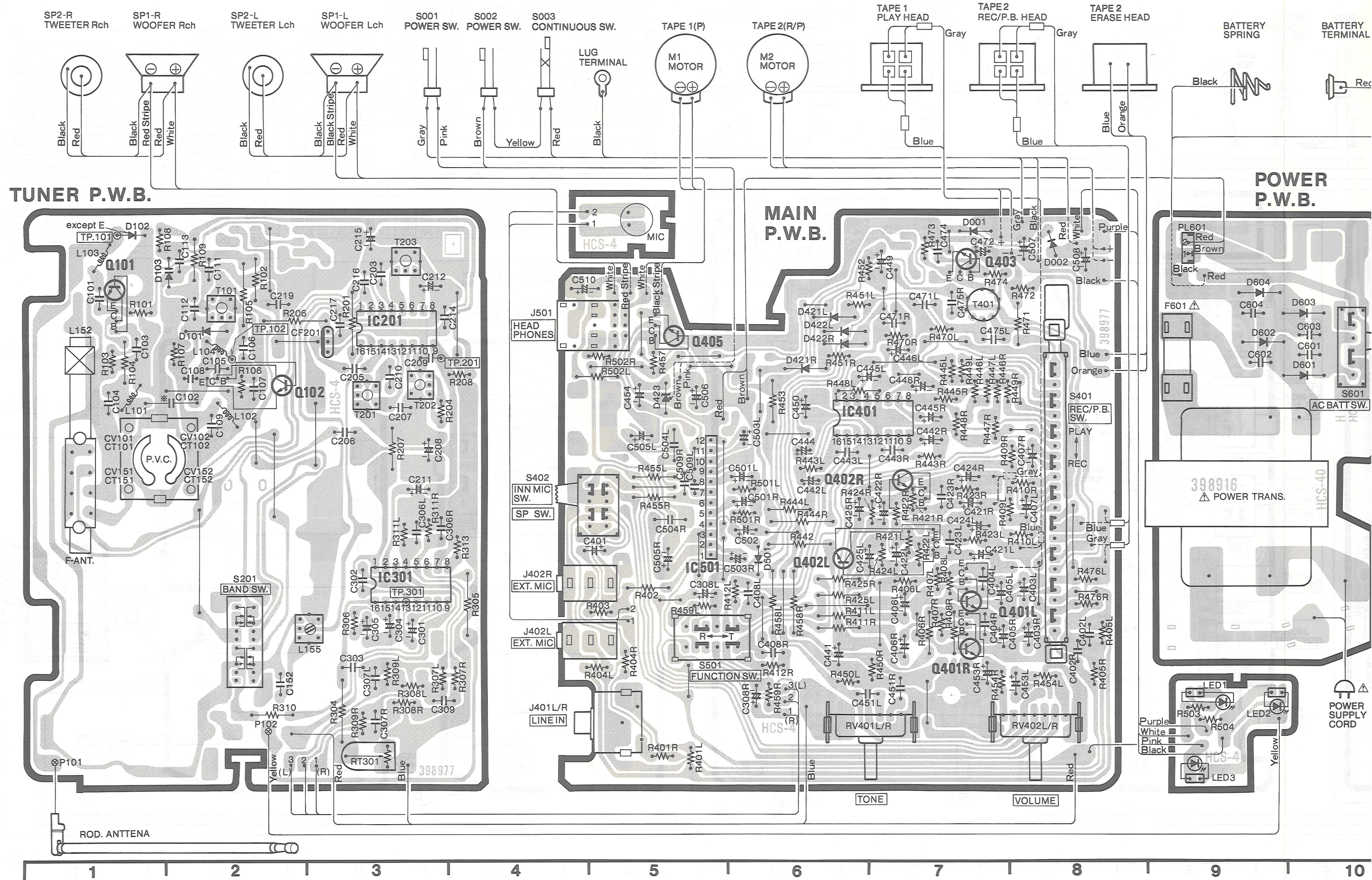


IC201		IC301	
	FM	AM	FM
1	0V	1.5V	5.4V
2	0V	1.5V	1.5V
3	2.1V	2.3V	1.8V
4	2.3V	2.3V	1.2V
5	0.8V	0.9V	1.2V
6	0.8V	0.9V	3.9V
7	—	—	0V
8	0V	0V	0.2V
9	1.4V	1.3V	0V
10	5.0V	5.0V	1.5V
11	5.0V	5.0V	1.5V
12	1.4V	1.4V	1.1V
13	1.4V	1.4V	1.5V
14	1.4V	1.4V	1.5V
15	1.4V	1.4V	1.5V
16	5.0V	5.0V	1.9V

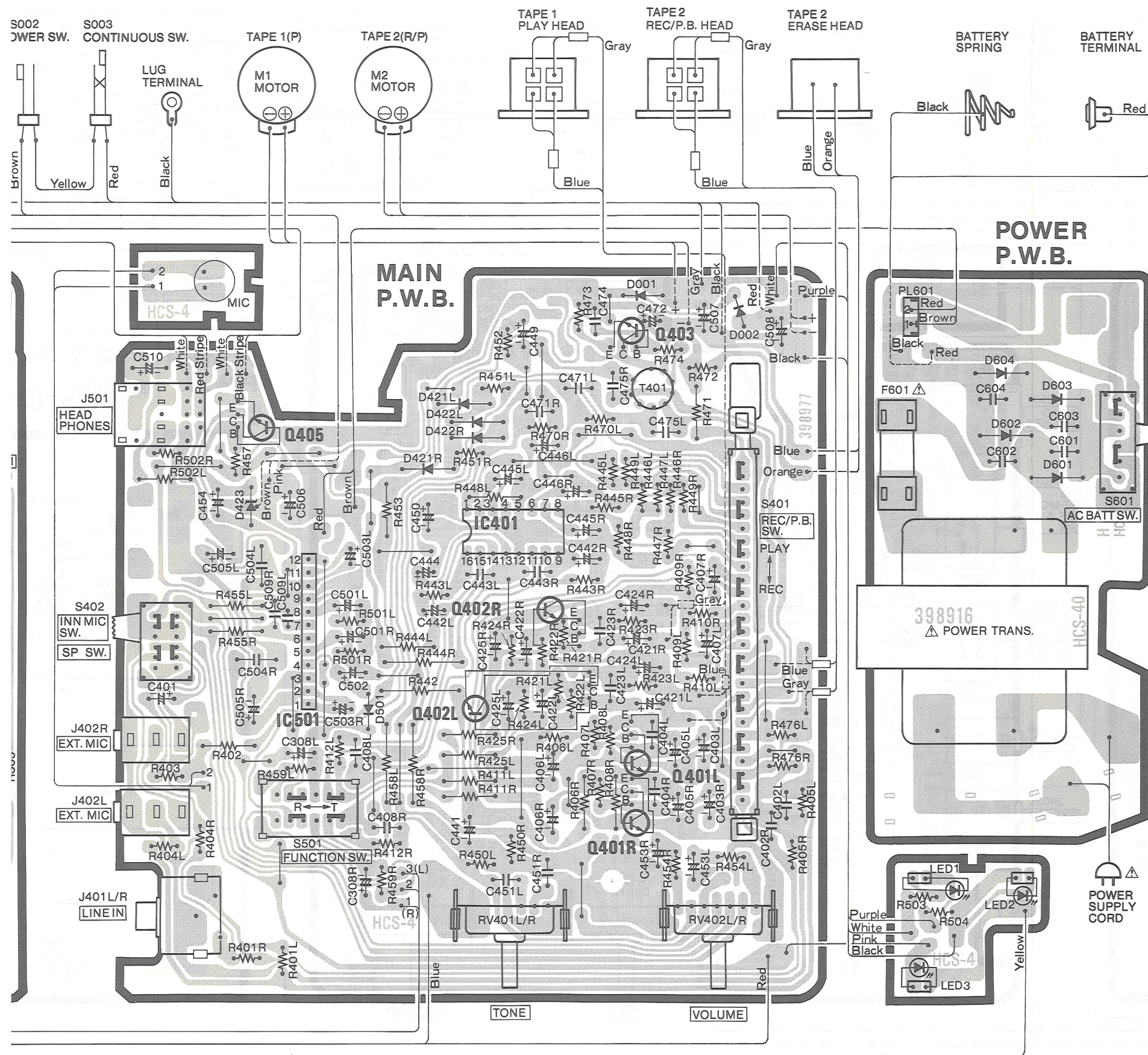
A
B
C
D
E

PRINTED WIRING BOARD
[For H, HC]

※ : Axial lead cylindrical ceramic capacitor



* : Axial lead cylindrical ceramic capacitor



IC201																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FM-ST	0V	0V	2.1V	2.3V	0.8V	0.8V	—	0V	1.4V	5.0V	5.0V	1.4V	1.4V	1.4V	1.4V	5.0V
AM	1.5V	1.5V	2.3V	2.3V	0.9V	0.9V	—	0V	1.3V	5.0V	5.0V	1.4V	1.4V	1.4V	1.4V	5.0V

IC301																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FM-ST	5.4V	1.5V	1.8V	1.2V	1.2V	3.9V	0V	0.2V	0V	1.5V	1.5V	1.1V	1.5V	1.5V	1.5V	1.9V
AM	5.4V	1.5V	1.8V	1.2V	1.2V	3.9V	0V	0.2V	2.1V	1.5V	1.5V	2.2V	1.5V	1.5V	1.5V	0.2V

IC401																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	0V	0.5V	2.0V	4.7V	0V	2.0V	0.5V	0V	0.5V	0V	0V	0V	4.4V	0V	0V	0.5V
REC	0V	0.5V	2.0V	4.7V	0V	2.0V	0.5V	0V	0.5V	0V	0V	0V	4.4V	0V	0V	0.5V

IC501												
	1	2	3	4	5	6	7	8	9	10	11	12
	7.2V	4.3V	8.3V	8.2V	0.6V	0V	0V	0.6V	0V	4.2V	7.2V	9.0V

Q101		
	FM-ST	AM
E	0.6V	4.5V
C	5.0V	5.0V
B	1.3V	4.8V

Q102		
	FM-ST	AM
E	0.65V	4.5V
C	5.0V	5.0V
B	1.3V	4.8V

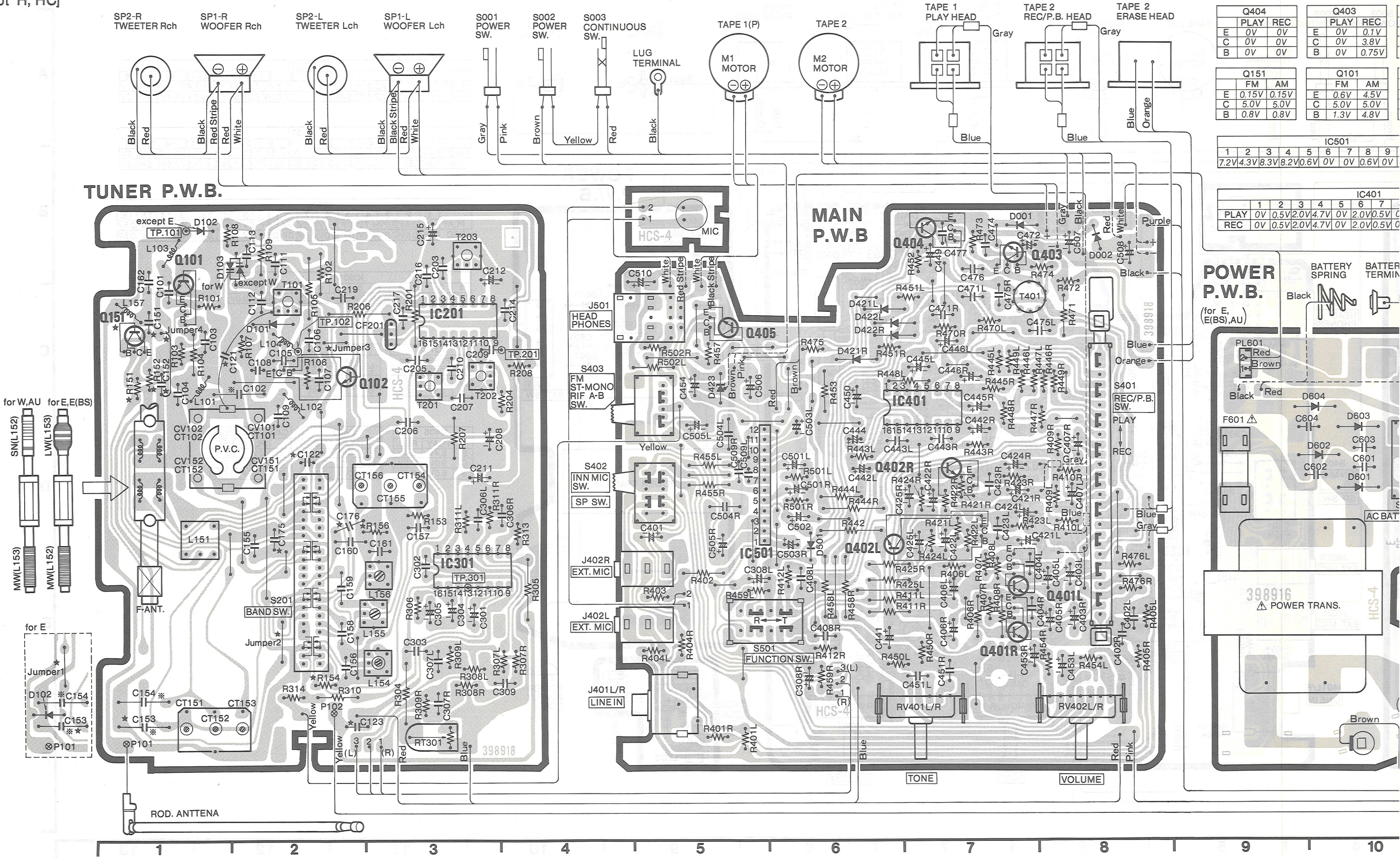
Q405		
	PLAY	REC
E	5.4V	5.4V
C	9.0V	9.0V
B	6.0V	6.0V

Q403		
	PLAY	REC
E	0V	0.1V
C	0V	3.8V
B	0V	0.75V

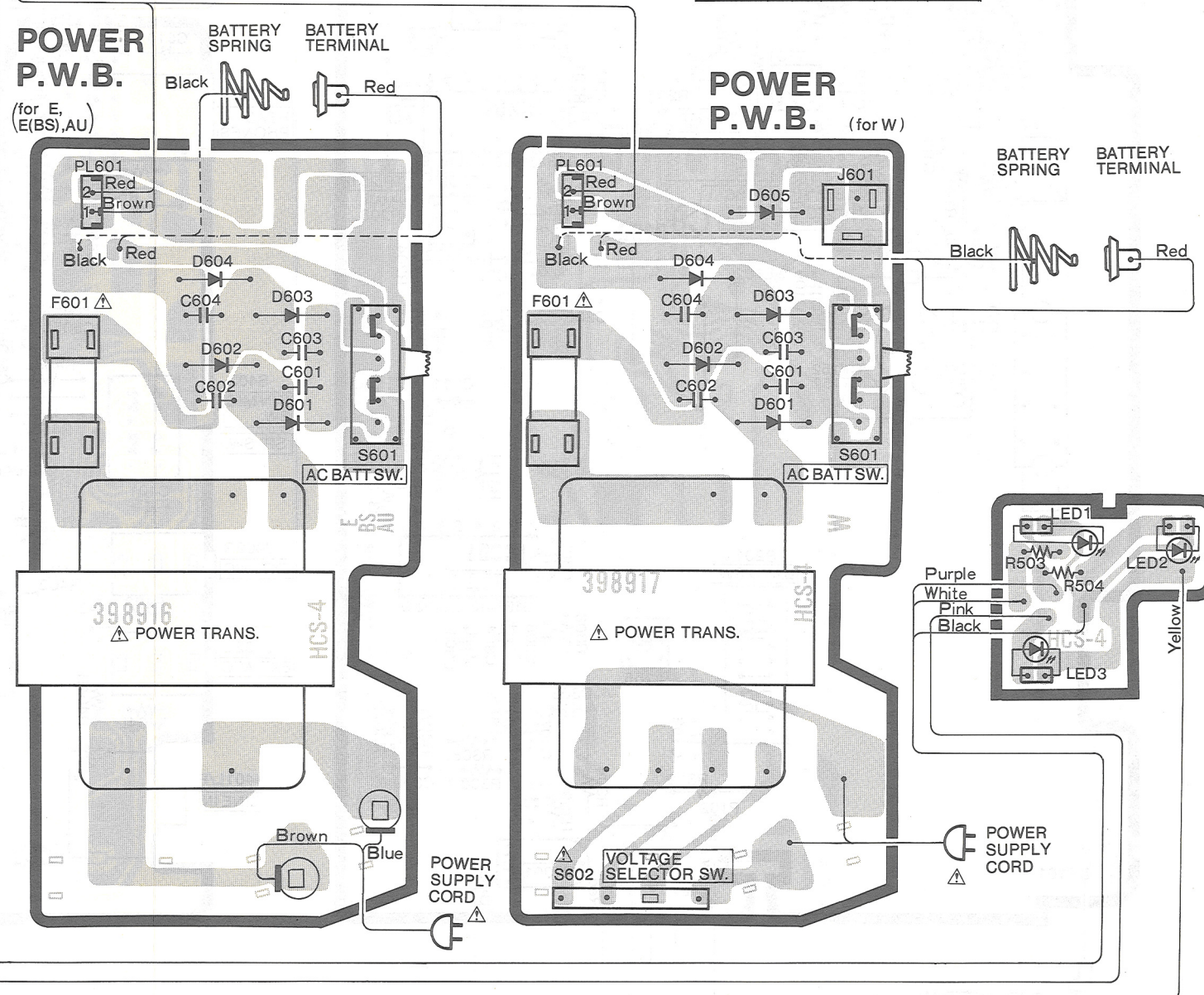
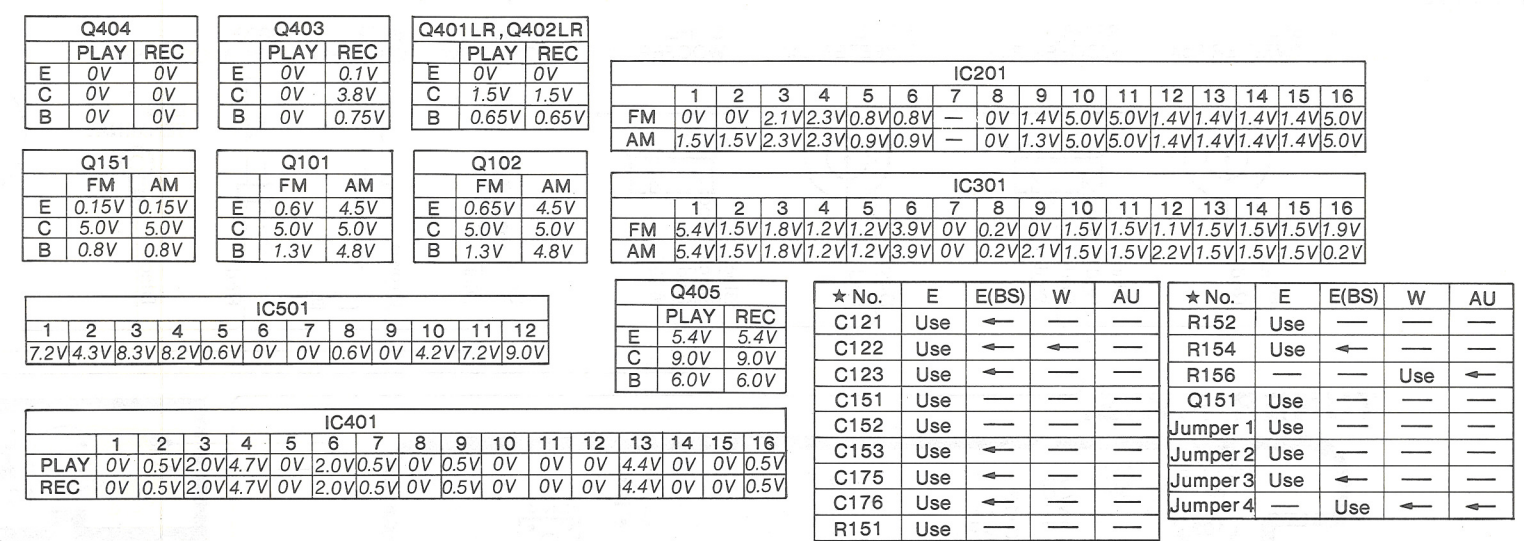
Q401LR, Q402LR			
	PLAY	REC	
E	0V	0V	
C	1.5V	1.5V	
B	0.65V	0.65V	

PRINTED WIRING BOARD
[Except H, HC]

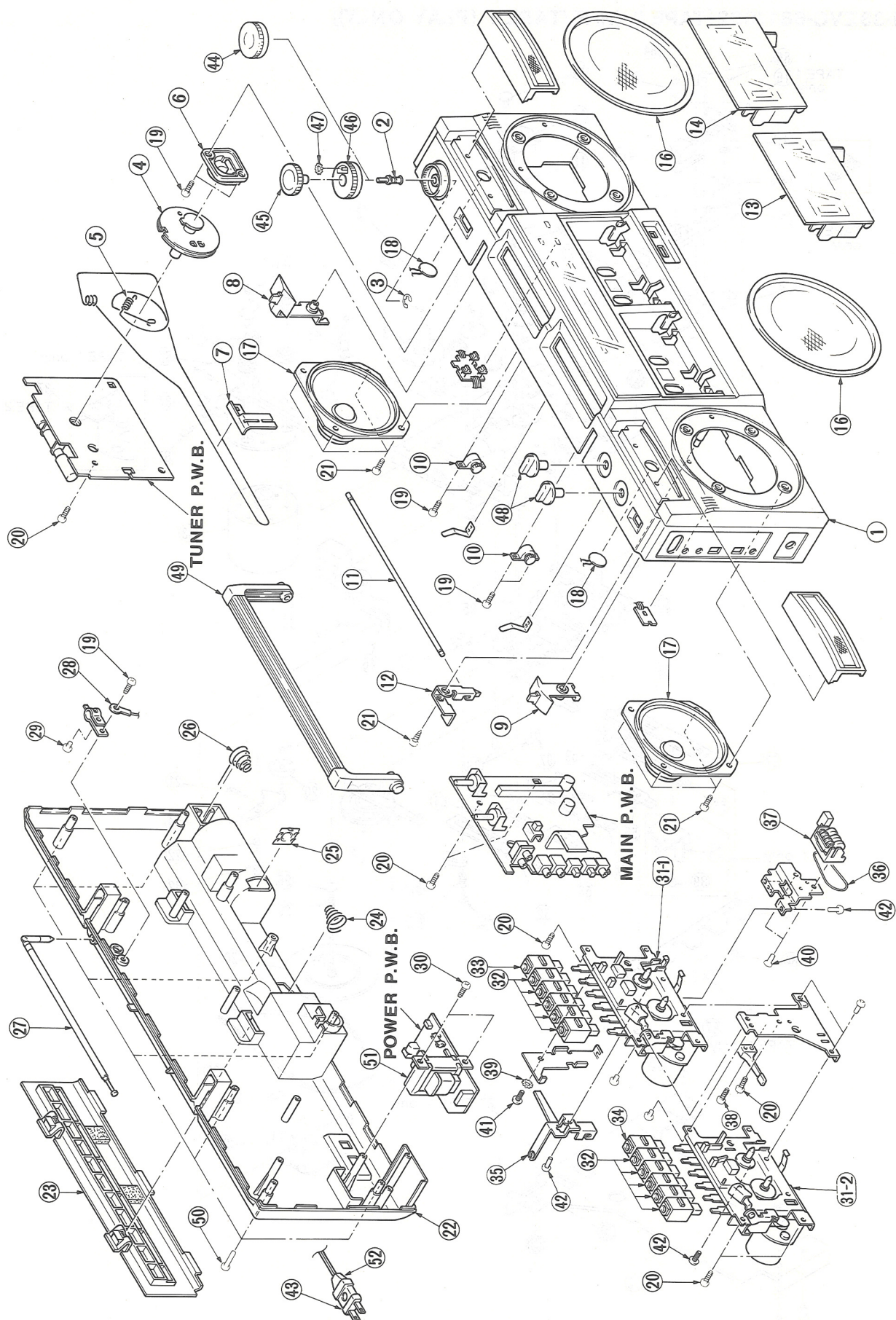
* : Axial lead cylindrical ceramic capacitor



A vertical scale with six horizontal tick marks. The labels A, B, C, D, E, and F are positioned to the right of the scale, aligned with each tick mark from top to bottom.

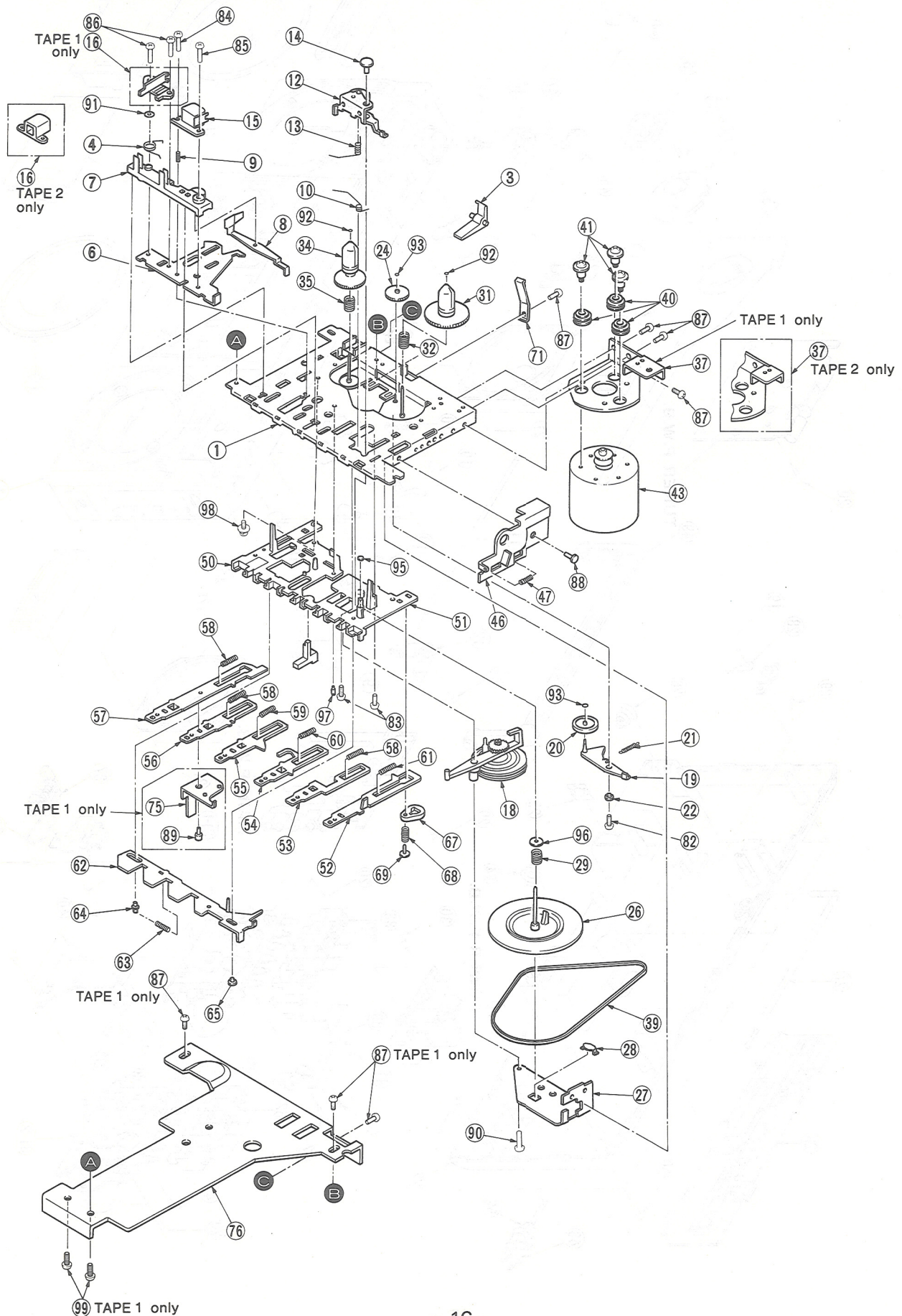


EXPLODED VIEW (Cabinet)



EXPLODED VIEW

TN-33ZVC-681/682 [TAPE 2 (R/P)/TAPE 1 (PLAY ONLY)]



REPLACEMENT PARTS LIST

SYMBOL No.	PART No.	DESCRIPTION	SYMBOL No.	PART No.	DESCRIPTION	SYMBOL No.	PART No.	DESCRIPTION
for FRONT CASE ASSEMBLY			for REAR CASE ASSEMBLY					
1	4027421	Front case ass'y [for H, HC]	22	4027451	Rear case ass'y [for H]	38	4582514	2 ϕ × 8 DT screw
	4027422	Front case ass'y [for E, E (BS)]		4027452	Rear case ass'y [for HC]	39	8815113	2.6 ϕ Lock washer
	4027423	Front case ass'y [for W]		4027453	Rear case ass'y [for E]	40	8721406	3 ϕ × 6 Flat head screw
	4027424	Front case ass'y [for AU]		4027454	Rear case ass'y [for E (BS)]	41	0741304	2.6 ϕ × 4 Bind screw
2	4591983	Tuning shaft		4027455	Rear case ass'y [for W]	42	4578282	2.6 ϕ × 5 DT screw (×4)
		[for H, HC, E, E (BS)]		4027456	Rear case ass'y [for W (UN)]	for FINAL ASSEMBLY		
	4591984	Tuning shaft [for W]		4027457	Rear case ass'y [for AU]	43	2667922	Siemens plug [for W]
3	4418013	E ring	23	3973523	Battery lid ass'y	44	3303182	Knob [for H, HC, E, E (BS)]
4	3348602	Pulley	24	3369849	Spring	45	3303092	Fine knob [for W, AU]
5	3340321	Spring	25	4436666	Terminal	46	3973051	Tuning knob [for W, AU]
6	3973081	Pulley holder	26	3369781	BAT spring	47	3348611	OG gear [for W, AU]
7	3973031	Pointer	27	2758012	Rod antenna	48	3303171	Select knob (×2)
8	4442031	Function lever	28	5895282	Rod antenna wire	49	4441859	Handle ass'y
9	3973061	Knob	29	4592528	3 ϕ × 8 flange head screw	50	4577817	3 ϕ × 30 Bind head screw (×8)
10	3950381	Damper ass'y (×2)	30	4578976	3 ϕ × 20 BT flange head screw (×2)	△ 51	2248925	Power trans. [for H, HC]
11	4591991	REC shaft	for CHASSIS ASSEMBLY			△	2248922	Power trans. [for E]
12	4441841	REC lever	31-1	2588501	TN-33 ZVC (TAPE 2)	△	2248923	Power trans. [for E (BS)]
13	3973093	Cassette lid	31-2	2588502	TN-33 ZVC (TAPE 1)	△	2248921	Power trans. [for W]
14	3973094	Cassette lid	32	3303163	Cassette button (×10)	△	2248924	Power trans. [for AU]
16	3973511	Speaker grille (×2)	33	3303164	Cassette button	△ 52	2706241	Power supply cord [for H, HC]
17	2402911	10 Speaker (×2)	34	3303165	Cassette button	△	2719449	Power supply cord [for E]
18	2403354	Piezo tweeter (×2)	35	4442082	REC arm ass'y	△	2717902	Power supply cord [for E, (BS)]
19	8691410	3 ϕ × 10 Bind head screw (×6)	36	4689531	Counter belt	△	2706264	Power supply cord [for W]
20	8699410	3 ϕ × 10 Bind head screw (×7)	37	2788864	Enplas counter	△	2706251	Power supply cord [for AU]
21	4578972	3 ϕ × 10 BT flange head screw (×9)		2789721	Leaf switch (×2)			
				2789711	Leaf switch			

TN-33 ZVC-681/682 (TAPE 2/TAPE 1)

ITEM No.	PART No.	DESCRIPTION	ITEM No.	PART No.	DESCRIPTION	ITEM No.	PART No.	DESCRIPTION
1	4815001	Chassis ass'y	35	4815014	Back tension spring	71	4815034	Pack spring
3	3959031	Record prevention lever (TAPE 2)	37	4815015	Motor bracket (TAPE 2)	75	4441801	Continuous play lever (TAPE 1)
4	4815002	REC spring	37	4451601	Motor bracket (TAPE 1)	76	4441831	Mecha. holder (TAPE 1)
6	4815003	Head panel	39	4690601	Belt	82	8691104	2 ϕ × 4 BT screw
7	3959051	Head base	40	4690591	Motor rubber (×3)	83	8691105	2 ϕ × 5 BT screw (×2)
8	4815004	Sensing plate ass'y	41	4586421	Special screw (×3)	84	8691108	2 ϕ × 8 Bind head screw
9	3365081	Spring for head	43	4816992	Motor ass'y	85	8691108	2 ϕ × 8 Bind head screw
10	4815005	Head panel spring	46	4815016	Eject lever ass'y	86	8691108	2 ϕ × 8 Bind head screw (×2)
12	4815006	Pinch roller ass'y	47	4815017	Eject lever spring	87	4578281	2.6 ϕ × 4 Screw
13	3365101	Spring						TAPE 2 (×4), TAPE 1 (×7)
14	3959061	Pressure roller arm stopper	50	4815021	Push button base (R)	88	8711305	2.6 ϕ × 5 Tapping screw
15	2555671	Record playback head	51	4815022	Push button base (L)	89	4578281	2.6 ϕ × 4 Screw
16	2555661	E.H. Head (TAPE 2)	52	4815023	Pause button lever ass'y	90	8691110	2 ϕ × 10 Bind tapping screw
16	4813851	Dummy head (TAPE 1)	53	4815024	Stop button lever	91	4701927	Washer
18	4815007	RF clutch arm ass'y	54	4815025	F.F. button lever	92	4701925	Washer (×2)
19	4815008	Take up roller arm ass'y	55	4815026	RWD button lever	93	4701926	Washer (×2)
20	4815009	Take up roller ass'y	56	4815027	Play button lever	95	4701921	Nylon washer
21	3365121	Spring (Take up roller arm)	57	4815028	REC button lever	96	4701924	Nylon washer
22	4586351	Coller (Take up roller arm)	58	3365171	Button lever spring (×3)	97	8691106	2 ϕ × 6 DT screw
			59	3365181	Spring (Button lever)	98	4586481	Coller screw
24	3959111	F.F. gear	60	3365191	Button lever spring	99	4567419	3 ϕ × 5 DT screw (×2) (TAPE 1)
			61	3365211	Spring (Button lever)			
26	4815011	Flywheel ass'y	62	4815031	Push button actuator ass'y			
27	4815012	Flywheel holder	63	3365201	Spring			
28	3959151	Flywheel plate	64	3959221	Actuator shaft			
29	3365131	Spring (Flywheel thrust)	65	3959231	Actuator shaft			
31	4815013	Take up reel ass'y	67	3959271	Pause lever			
32	4815014	Back tension spring (TAPE 1)	68	4815032	Pause lever spring			
32	3365151	Back tension spring (TAPE 2)	69	4815033	Pause lever stopper			
34	3959381	Supply reel ass'y						

REPLACEMENT PARTS LIST

CD : Ceramic discal
PP : Polypro-pylene

CC : Cylindrical ceramic
STY : Styrol

EL : Electrolytic
CF : Carbon film

MF : Mylar, film

H : U.S.A.

HC : Canada

E : Europe (except U.K.)

E (BS) : U.K.

AU : Australia

W : Asia & Latin American countries, etc.

SYMBOL No.	PART No.	DESCRIPTION					SYMBOL No.	PART No.	DESCRIPTION					SYMBOL No.	PART No.	DESCRIPTION				
CAPACITORS							C162	0208635	CD	5pF	±0.25%	50V	C471LR	0209734	CD	3300pF	±10%	50V		
C101	0208635	CD	5pF	±0.25%	50V	C175	0208680	CD	68pF	±5%	50V	C472	0252331	EL	100μF		10V			
C102	0230008	CC	4.7pF	±10%	50V							C474	0209161	CD	1000pF	+80% -20%	50V			
C103	0209161	CD	1000pF	+80% -20%	50V							C475LR	0274013	MF	2200pF	±10%	50V			
C104	0208664	CD	15pF	±5%	50V							C476	0275013	MF	0.022μF	±10%	50V			
C105	0208678	CD	56pF	±5%	50V							C477	0244171	CD	[except H, HC]	0.01μF	+80% -20%	50V		
C106	0209721	CD	330pF	±10%	50V															
C107	0209161	CD	1000pF	+80% -20%	50V															
C108	0246426	CD	6pF	±0.5%	50V															
C108	0246427	CD	[except W]	7pF	±0.5%	50V														
							[for W]													
C109	0248480	CD	10pF	±5%	50V	C205	0244171	CD	0.01μF	+80% -20%	50V	C501LR	0252325	EL	47μF		10V			
C109	0246413	CD	[except W]	3pF	±0.25%	50V	C206	0249765	CD	0.047μF	±20%	50V	C502	0252531	EL	100μF		16V		
							[for W]						C503LR	0252325	EL	47μF		10V		
C111	0244171	CD	0.01μF	+80% -20%	50V	C207	0244171	CD	0.01μF	+80% -20%	50V	C504LR	0276012	MF	0.15μF	±10%	50V			
C112	0246415	CD	5pF	±0.25%	50V	C208	0252233	EL	330μF		6.3V	C505LR	0252235	EL	470μF		6.3V			
C113	0209161	CD	1000pF	+80% -20%	50V	C209	0209161	CD	1000pF	+80% -20%	50V	C506	0252541	EL	1000μF		16V			
C121	0208684	CD	[except E, E (BS)]	100pF	±5%	50V	C210	0244173	CD	0.022μF	+80% -20%	50V	C507	0252532	EL	220μF		16V		
							C211	0252813	EL	3.3μF		50V	C508	0252532	EL	220μF		16V		
C122	0208684	CD	100pF	±5%	50V	C212	0252322	EL	22μF		10V	C509LR	0244161	CD	1000pF	+80% -20%	50V			
C123	0209161	CD	[except E, E (BS)]	1000pF	+80% -20%	50V	C214	0209175	CD	0.047μF	+80% -20%	50V	C510	0256676	EL	47μF		10V		
							C215	0252805	EL	0.47μF		50V	C601	0244171	CD	0.01μF	+80% -20%	50V		
C151	0244171	CD	0.01μF	+80% -20%	50V	C216	0244173	CD	0.022μF	+80% -20%	50V	C604	0244171	CD	0.01μF	+80% -20%	50V			
C152	0244171	CD	0.01μF	+80% -20%	50V	C217	0208684	CD	100pF	±5%	50V									
C152	0208632	CD	2pF	±0.25%	50V	C219	0244173	CD	0.022μF	+80% -20%	50V	RESISTORS								
C153	0230014	CD	12pF	±5%	50V	C301	0252813	EL	3.3μF		50V	R101	0113615	CF	1kΩ	±5%	SRD1/6P			
C154	0230008	CD	[except H, HC]	4.7pF	±10%	50V	C302	0209175	CD	0.047μF	+80% -20%	50V	R102	0113579	CF	33Ω	±5%	SRD1/6P		
							C303	0268444	PP	470pF	±5%	100V	R103	0113679	CF	470kΩ	±5%	SRD1/6P		
C154	0230006	CD	[except W, AU]	3.3pF	±10%	50V	C304	0252803	EL	0.33μF		50V	R104	0113583	CF	47Ω	±5%	SRD1/6P		
							C305	0252811	EL	1μF		50V	R105	0113615	CF	1kΩ	±5%	SRD1/6P		
C155	0208650	CD	10pF	±0.5%	50V	C306LR	0209735	CD	4700pF	±10%	50V	R106	0113679	CF	470kΩ	±5%	SRD1/6P			
C155	0208647	CD	[except W, AU]	7pF	±0.5%	50V	C307LR	0209765	CD	0.047μF	±20%	50V	R107	0113615	CF	1kΩ	±5%	SRD1/6P		
							C308LR	0252805	EL	0.47μF		50V	R107	0113617	CF	[except E]	1.2kΩ	±5%	SRD1/6P	
C156	0208662	CD	12pF	±5%	50V	C309	0209161	CD	1000pF	+80% -20%	50V	R107								0113619
C156	0208650	CD	[except W, AU]	10pF	±0.5%	50V	C401	0252805	EL	0.47μF		50V	R108	0113639	CF	10kΩ	±5%	SRD1/6P		
							C402LR	0244171	CD	0.01μF	+80% -20%	50V	R109	0113663	CF	100kΩ	±5%	SRD1/6P		
C157	0208650	CD	[except E, E (BS)]	10pF	±0.5%	50V	C403LR	0252802	EL	0.22μF		50V	R151	0113591	CF	[except E]	100Ω	±5%	SRD1/6P	
							C404LR	0209163	CD	2200pF	+80% -20%	50V								R152
C157	0208635	CD	5pF	±0.25%	50V	C405LR	0252803	EL	0.33μF		50V	R153	0113645	CF	[except E, E (BS)]	18kΩ	±5%	SRD1/6P		
C158	0275011	MF	0.01μF	±10%	50V	C406LR	0252803	EL	0.33μF		50V								R153	0113643
C158	0275012	MF	0.015μF	±10%	50V	C407LR	0252803	EL	0.33μF		50V	R154	0113609	CF	[except E, E (BS)]	560Ω	±5%	SRD1/6P		
C159	0268321	PP	360pF	±5%	100V	C408L	0249765	CD	0.047μF	±20%	50V								R156	0113645
C159	0268442	PP	[except W, AU]	1500pF	±5%	100V	C408R	0209765	CD	0.047μF	±20%	50V	R201	0113583	CF	47Ω	±5%	SRD1/6P		
							C421LR	0252802	EL	0.22μF		50V							R204	0113643
C160	0221317	STY	180pF	±5%	50V	C422LR	0252803	EL	0.33μF		50V	R206	0113597	CF	180Ω	±5%	SRD1/6P			
C160	0268321	PP	[except E, E (BS)]	360pF	±5%	100V	C423LR	0209163	CD	2200pF	+80% -20%	50V	R207	0129543	CF	33Ω	±5%	SRD1/4P		
							C424LR	0252803	EL	0.33μF		50V	R208	0113663	CF	100kΩ	±5%	SRD1/6P		
C161	0208648	CD	8pF	±0.5%	50V	C425LR	0252803	EL	0.33μF		50V	R304	0113645	CF	18kΩ	±5%	SRD1/6P			
C161	0208666	CD	[except W, AU]	18pF	±5%	50V	C441	0252232	EL	220μF								6.3V	R305	0113603
							C442LR	0252521	EL	10μF		16V	R306	0113615	CF	1kΩ	±5%	SRD1/6P		
							C443LR	0209161	CD	1000pF	+80% -20%	50V	R307LR	0113639	CF	10kΩ	±5%	SRD1/6P		
							C444	0252333	EL	33μF		10V	R308LR	0113655	CF	47kΩ	±5%	SRD1/6P		
							C445LR	0252325	EL	47μF		10V								
							C446LR	0252323	EL	33μF		10V								
							C449	0252331	EL	100μF		10V								
							C450	0252232	EL	220μF		6.3V								
							C451LR	0209764	CD	0.033μF	±20%	50V								
							C453LR	0252804	EL	0.15μF		50V								
							C454	0252335	EL	470μF		10V								

SYMBOL No.		PART No.		DESCRIPTION		SYMBOL No.		PART No.		DESCRIPTION		SYMBOL No.		PART No.		DESCRIPTION	
R309LR 0113615 CF 1kΩ ±5% SRD1/6P						Q401LR 2319091 HIT9014N (C)						MISCELLANEOUS					
R310 0113631 CF 4.7kΩ ±5% SRD1/6P						Q402LR 2319091 HIT9014N (C)											
R311LR 0113627 CF 3.3kΩ ±5% SRD1/6P						Q403 2319101 2SC1684R						CF201 2135321 Ceramic filter 10.7					
R313 0113599 CF 220Ω ±5% SRD1/6P						Q404 2319052 HIT8050C [except H, HC]						CV101 0282193 Variable capacitor [for H, HC]					
R314 0113599 CF 220Ω ±5% SRD1/6P [except H, HC]						Q405 2319062 HIT5609C						CV101 0282182 Variable capacitor [except H, HC]					
R401LR 0113675 CF 330kΩ ±5% SRD1/6P						DIODES						CV102 0282193 Variable capacitor [for H, HC]					
R402 0113631 CF 4.7kΩ ±5% SRD1/6P												CV102 0282182 Variable capacitor [except H, HC]					
R403 0113615 CF 1kΩ ±5% SRD1/6P						D001 2398081 1N4148						CV151 0282193 Variable capacitor [for H, HC]					
R404LR 0113613 CF 820Ω ±5% SRD1/6P						D002 2398081 1N4148						CV151 0282182 Variable capacitor [except H, HC]					
R405LR 0113607 CF 470Ω ±5% SRD1/6P						D101 2398082 1N4148						CV152 0282193 Variable capacitor [for H, HC]					
R406LR 0113633 CF 5.6kΩ ±5% SRD1/6P						D102 2398082 1N4148						CV152 0282182 Variable capacitor [except H, HC]					
R407LR 0113679 CF 470kΩ ±5% SRD1/6P						D103 2338031 1S2790						CT101 0282193 Variable capacitor [for H, HC]					
R408LR 0113581 CF 39Ω ±5% SRD1/6P						D421LR 2398082 1N4148						CT101 0282182 Variable capacitor [except H, HC]					
R409LR 0113605 CF 390Ω ±5% SRD1/6P						D422LR 2398082 1N4148						CT102 0282193 Variable capacitor [for H, HC]					
R410LR 0113611 CF 680Ω ±5% SRD1/6P						D423 2338003 HZ6C						CT102 0282182 Variable capacitor [except H, HC]					
R411LR 0113637 CF 8.2kΩ ±5% SRD1/6P						D501 2398081 1N4148						CT151 0282193 Variable capacitor [for H, HC]					
R412LR 0113637 CF 8.2kΩ ±5% SRD1/6P						D601 2398062 1N4001 }						CT152 0282193 Variable capacitor [for H, HC]					
R421LR 0113679 CF 470kΩ ±5% SRD1/6P						D604 2398062 1N4001 }						CT151 0283130 Semi variable capacitor [except H, HC]					
R422LR 0113633 CF 5.6kΩ ±5% SRD1/6P						D605 2398062 1N4001 [for W]						CT156 0283130 Semi variable capacitor [except H, HC]					
R423LR 0113581 CF 39Ω ±5% SRD1/6P						COILS & TRANSFORMERS						RT301 0199331 Semi variable resistor FM MPX adj.					
R424LR 0113605 CF 390Ω ±5% SRD1/6P												L101 2137683 FM RF coil					
R425LR 0113637 CF 8.2kΩ ±5% SRD1/6P						L102 2137682 FM OSC coil [except W]						LED2 2397753 LN217RP					
R442 0113603 CF 330Ω ±5% SRD1/6P						L102 2137681 FM OSC coil [for W]						LED3 2397753 LN217RP					
R443LR 0113623 CF 2.2kΩ ±5% SRD1/6P						L103 2137684 Choke coil (0.45μH)						S001 2789721 Leaf switch (POWER SW.)					
R444LR 0113631 CF 4.7kΩ ±5% SRD1/6P						L104 2137684 Choke coil (0.45μH)						S002 2789721 Leaf switch (POWER SW.)					
R445LR 0113667 CF 150kΩ ±5% SRD1/6P						L151 2137661 SW ANT coil [for E (BS)]						S003 2789711 Leaf switch (CONTINUOUS SW.)					
R446LR 0113659 CF 68kΩ ±5% SRD1/6P						L151 2137662 SW ANT coil [for E]						S201 2629282 Slide switch (BAND SW.) [except H, HC]					
R447LR 0113659 CF 68kΩ ±5% SRD1/6P						L151 2137663 SW ANT coil [for W, AU]						S201 2629271 Slide switch (BAND SW.) [for H, HC]					
R448LR 0113589 CF 82Ω ±5% SRD1/6P						L152 2758002 Ferrite antenna [for H, HC]						S401 2629291 Slide switch (REC/P.B. SW.)					
R449LR 0113665 CF 120kΩ ±5% SRD1/6P						L152 2757992 Ferrite antenna [for E, E (BS)]						S402 2628341 Slide switch (INN MIC, SP SW.)					
R450LR 0113639 CF 10kΩ ±5% SRD1/6P						L152 2757981 Ferrite antenna [for W, AU]						S403 2628342 Slide switch (FM ST-MONO, RIF A-B SW.) [except H, HC]					
R451LR 0113591 CF 100Ω ±5% SRD1/6P						L153 2757992 Ferrite antenna [for E, E (BS)]						S501 2629301 Slide switch (FUNCTION SW.)					
R452 0113663 CF 100kΩ ±5% SRD1/6P						L153 2757981 Ferrite antenna [for W, AU]						S601 2629261 Slide switch (AC BATTERY)					
R453 0129561 CF 100Ω ±5% SRD1/4P						L154 2137671 SW OSC coil [for E, E (BS)]						△ S602 2618471 VOL switch (VOLTAGE SELECTOR) [for W]					
R454LR 0113625 CF 2.7kΩ ±5% SRD1/6P						L154 2137672 SW OSC coil [for W, AU]						△ F601 2728073 Fuse T1.25A [except H, HC]					
R455LR 0113615 CF 1kΩ ±5% SRD1/6P						L155 2137631 MW OSC coil [for E, E (BS)]						△ F601 2728062 UL Fuse 1.25A [for H, HC]					
R457 0113615 CF 1kΩ ±5% SRD1/6P						L155 2137634 MW OSC coil [for H, HC]						2727832 Fuse holder					
R458LR 0113655 CF 47kΩ ±5% SRD1/6P						L155 2137633 SW OSC coil [for W, AU]						J401LR 2678151 Pin Jack					
R459LR 0113623 CF 2.2kΩ ±5% SRD1/6P						L156 2137642 LW OSC coil [for E, E (BS)]						J402LR 2679371 3.5 Jack					
R470LR 0113639 CF 10kΩ ±5% SRD1/6P						L156 2137631 MW OSC coil [for W, AU]						J601 2678282 DC Jack [for W]					
R471 0129551 CF 68Ω ±5% SRD1/4P						L157 2137684 Choke coil [except H, HC] (0.45μH)						J501 2678234 Headphone Jack					
R472 0113595 CF 270Ω ±5% SRD1/6P						T101 2154962 FM IF trans.						2737441 Mic					
R473 0113563 CF 6.8Ω ±5% SRD1/6P						T201 2154952 AM IF trans.											
R474 0113655 CF 47kΩ ±5% SRD1/6P						T202 2154964 FM IF trans.											
R475 0113615 CF 1kΩ ±5% SRD1/6P [except H, HC]						T203 2154951 AM IF trans.											
R476LR 0113663 CF 100kΩ ±5% SRD1/6P						T401 2137651 REC OSC trans.											
R501LR 0113595 CF 150Ω ±5% SRD1/6P						VARIABLE RESISTORS											
R502LR 0113587 CF 68Ω ±5% SRD1/6P																	
R503 0170354 CF 1.5kΩ ±5% SRD1/6P						RV401LR 0166931 10K-(A) TONE											
R504 0170354 CF 1.5kΩ ±5% SRD1/6P						RV402LR 0166943 10K-(3B) VOLUME											
ICS & TRANSISTORS																	
IC201 2389511 TA7640AP																	
IC301 2389501 HA12026																	
IC401 2369501 BA343																	
IC501 2300021 TA7282AP																	
Q101 2319071 HIT9016G																	
Q102 2319071 HIT9016G																	
Q151 2319081 HIT9011H [for E]																	



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